

[Document name] Claims

[Claim 1]

A guiding device for discs includes a hopper (10) for letting off discs (D) one by one, a guiding unit (15) for guiding and aligning the discs (D), characterized in that:

the guiding unit (15) includes a hopper side guiding unit (17), and a dispensing side guiding unit (18), it is also detachable to cross the longitudinal direction to the guiding unit,

the dispensing side guiding unit (18) can pivot on a shaft (56) which is located beside the guiding unit (15).

[Claim 2]

The guiding device for the discs claimed in claim 1,

the dispensing side guiding unit (18) includes an buffering unit (60).

[Claim 3]

The guiding device for the discs claimed in claim 1, further, includes a fixing unit (80) for fixing the dispensing side guiding unit (18) on the extending line of the hopper side guiding unit (17).

[Claim 4]

The guiding device for the discs claimed in claim 3,

the fixing unit (80) is an automatically fixing unit (306) which is automatically fixed based on the returning movement of the dispensing side guiding unit (18).

[Claim 5]

The guiding device for the discs claimed in claim 4,

the automatic fixing unit (306) can release the hooked by one operation.

[Claim 6]

The guiding device for the discs claimed in claim 3,

further, includes a detecting unit (244) for detecting, as there isn't the dispensing side guiding unit (18) on the extending line of the hopper side guiding unit (17) and

a controlling unit (238) for turning off the hopper (10), when the detecting unit (244) detects there is not dispensing side guiding unit (18).

[Document name] Specification

[Title of The Invention] A guiding device of discs

[Technical field to which the invention pertains]

[0001]

This invention relates to a guiding unit for discs which are aligned.

More especially, this invention relates to the improvement of the guiding unit which is detachable.

"Disc" which is used on this specification embraces medals or tokens like a coin.

[Description of the Prior Art]

[0002]

The first prior art discloses a disc guiding unit which aligns the discs which are let off one by one from the hopper.

Also, the guiding unit can be detached at the hopper.

(for example: see Patent document 1)

The second prior art discloses a detachable guiding unit for resolving the jammed up coins in the guiding unit.

(for example: see Patent document 2)

[0003]

[Patent document 1] US Patent No. 5876275 (figure 2-3)

[Patent document 2]

Japanese examined Utility model 6-3668 (figure 1 -4, page 2-3).

[Disclosure of the invention]

[Problem(s) to be Solved by the Invention]

[0004]

The second prior art can be combined with the first prior art as this help to resolve the jamming of the coins.

In this combination, the guiding unit is detachable to the hopper side unit and the dispensing side unit, they are both connected by the fixing unit.

When the jamming occurs in the guiding unit, the dispensing side unit is detached from the hopper side guiding unit.

Next, the jammed coins are taken away from the guiding unit, afterwards the dispensing side unit is attached to the hopper side unit.

[0005]

The separatable structure has some common faults, for example deformation and damage.

Because operators sometimes handle the detached unit roughly or carelessly.

In another case, when the entrance is rather small, the dispensing side unit must be detached from the hopper with the hopper side unit.

Afterwards, the dispensing side unit is attached to the hopper side unit.

Therefore the detaching and attaching process can be tedious.

[0006]

The first purpose of the present invention is to make the task of the jammed coins easier to recover.

The second purpose of the present invention is to prevent deformation and damage.

The third purpose of the present invention is to make it easier for the hopper with the guiding unit to go in and out of the gaming machine, when the entrance is rather small.

The fourth purpose of the present invention is to prevent dispensing of the discs when the dispensing side guiding unit is detached.

The fifth purpose of the present invention is to make unification easier.

[0007]

[Means for Solving the Problem]

This invention comprises of the following structure.

A guiding device for discs includes a hopper for letting off discs one by one, a guiding unit for guiding and aligning the discs,

characterized in that:

the guiding unit includes a hopper side guiding unit and a dispensing side guiding unit and it is detachable to cross the longitudinal direction to the guiding unit,

the dispensing side guiding unit can pivot on a shaft which is located beside the guiding unit.

[0008]

In this structure, the guiding unit includes the hopper side guiding unit and the dispensing side guiding unit.

When discs jam, the dispensing side guiding unit can be pivoted on the shaft.

Therefore the dispensing side guiding unit can be moved away from the hopper side guiding unit.

As a result, the end faces of the guiding passageways are opened.

In this situation, the jamming discs are taken away from either the dispensing side guiding unit or the hopper side guiding unit by a screw driver or etc.

Afterwards, the dispensing side guiding unit is removed, and is combined to the hopper side guiding unit.

[0009]

Accordingly, the dispensing side guiding unit cannot be handled roughly because of the dispensing side guiding unit cannot be taken away from the hopper.

As a result, the dispensing side guiding unit does not incur damage.

Also, when the dispensing side guiding unit pivots, the hopper with the guiding unit is not higher.

Therefore when the entrance is small the hopper unit can be removed into and out the gaming machine at the combined situation.

Afterwards the dispensing side guiding unit pivots on the shaft, and fixed at the hopper side guiding unit.

As a result, it is easier to operate.

[0010]

This invention is desirable because the dispensing side guiding unit includes an buffering unit.

In this structure, when the dispensing side guiding unit pivots on the shaft, the pivoting speed of the guiding unit is reduced.

Therefore when the dispensing side guiding unit has contact with the stopper, the speed is lower, and the shock of the dispensing side guiding unit is reduced.

As a result, the dispensing side guiding unit does not incur damage.

[0011]

This invention is desirable because further, it includes a fixing unit for fixing the dispensing side guiding unit on the extending line of the hopper side guiding unit.

In this structure, the dispensing side guiding unit is fixed on the extending line of the hopper side guiding unit.

Therefore when the discs are dispensed, the position of the dispensing side guiding unit is fixed, also the dispensing of the coins are stabilized.

[0012]

This invention is desirable, because the fixing unit is an automatic fixing unit which is automatically fixed based on the returning movement of the dispensing side guiding unit.

In this structure, the dispensing side guiding unit is automatically fixed on extending line of the hopper side guiding unit based on the returning movement.

Therefore when the dispensing side guiding unit is fixed, the operator doesn't operate.

[0013]

This invention is desirable, because the automatic fixing unit can release the hooked by one operation.

In this structure, when the dispensing side guiding unit is separated from the hopper side guiding unit, it can be detached by a single operation.

Therefore the operation becomes easier.

[0014]

This invention is desirable, because further, includes a detecting unit for detecting, as there isn't the dispensing side guiding unit on the extending line of the hopper side

guiding unit, and

a controlling unit for turning off the hopper, when the detecting unit detects there is no dispensing side guiding unit.

In this structure, when the dispensing side guiding unit is separated from the hopper side guiding unit, the detecting unit detects that there no dispensing side guiding unit.

Therefore the driving circuit is "OFF", also the hopper can not rotate.

In this situation, the jammed discs are taken away from either the dispensing side guiding unit or the hopper side guiding unit by a screw driver or etc.

Afterwards, the dispensing side guiding unit is removed, and is combined to the hopper side guiding unit.

The unified dispensing side guiding unit and hopper side guiding unit are connected by the fixing unit.

Therefore the detecting unit detects the dispensing side guiding unit; the detecting unit is turned on by the dispensing side guiding unit.

As a result, the driving circuit is turned on, therefore the hopper can rotate.

Therefore when the dispensing side guiding unit is separated from the hopper, the hopper does not operate.

As a result, the discs are not scattered about.

[0015]

Also this invention is desirable, because they have the following structures.

Firstly, the invention is desirable because the buffering unit is a spring, the end of the spring is attached at the dispensing side guiding unit and the other end is slidable at the hopper side guiding unit.

In this structure, when the dispensing side guiding unit pivots on the shaft, the movement of the spring increases in proportion as to the pivoting angle of the guiding unit.

The pivoting speed of the guiding unit reduces by the movement.

Accordingly, the buffering unit is the spring therefore it is inexpensive.

[0016]

Secondly, the shaft is located at the rotating disc side rather than at the separating section.

In this structure, when the dispensing side guiding unit pivots on the shaft, the guiding unit lays down, therefore the height of the hopper is rather low.

Also, the size of the unit is also reduced.

Accordingly, the hopper is easy to transport, therefore the transporting fees are reduced.

When the entrance of the gaming machine is small, therefore the movement working of the

hopper for example; removing and putting in the hopper of the gaming machine is easier, because the height of the hopper is lower.

[0017]

Thirdly the shaft can pivot on the axis line which crosses at right angles to the flat surface of the disc in the guiding unit.

Usually, the guiding unit has a base plate, and the face of the disc is guided by the plate. Therefore the dispensing side guiding unit can pivot at the axis line which crosses the face of the disc at a right angle.

The separating section between the base plate of hopper side and the base plate of dispensing side fits automatically.

Accordingly, the combining task is easier.

[0018]

Fourth, one section of the guiding unit is concave shape and the other of the guiding unit is convex at the separating section.

In this structure, when the hopper side guiding unit and the dispensing side guiding unit are combined, the convex section is inserted into the concave section.

As a result, the installment is easier.

[0019]

Fifth, hopper side guiding unit includes one end of the hopper side base plate which is crank shaped, a pair of hopper side spacers which has a distance slightly larger than the diameter of the disc and a pair of hopper side holder plates which are located opposite the base plate of the spacers;

the dispensing side guiding unit includes a dispensing side base plate, a pair of dispensing side spacers which has the same distance as the hopper side spacers and a pair of dispensing side holder plates which are located opposite the dispensing side base plate; the end of the dispensing side base plate can be located between the hopper side base plate and the spacers and the upper ends of the hopper side spacers can be located between the dispensing side base plate and the dispensing side holder plates.

[0020]

In this structure, the concave section is structured between the dispensing base plates and the dispensing holder plates, and the convex section is the hopper side spacers.

The convex sections are inserted into the concave sections, at this point they are combined. Therefore the installment is easier and the unit is more solid.

[0021]

Sixth, the fixing unit is a one-touch fixing unit.

In this structure, when the dispensing side guiding unit is attached or detached at the hopper side guiding unit, the one touch fixing unit is operated.

Therefore the dispensing side guiding unit can be attached or detached by the operation of the "one touch".

Also the operation is easier.

[0022]

Accordingly, the dispensing side guiding unit cannot be handled roughly because of the dispensing side guiding unit cannot be taken away from the hopper.

As a result, the dispensing side guiding unit does not incur damage.

Also, when the dispensing side guiding unit pivots, the hopper with the guiding unit is not higher.

Therefore when the entrance is small the hopper unit can be removed into and out the gaming machine at the combined situation.

Afterwards the dispensing side guiding unit pivots on the shaft, and fixed at the hopper side guiding unit.

As a result, it is easier to operate.

[Best mode of the invention]

[0023]

A guiding device for discs includes a hopper for letting off discs one by one, a guiding unit for guiding and aligning the discs,

characterized in that:

the guiding unit includes a hopper side guiding unit and a dispensing side guiding unit and it is detachable to cross the longitudinal direction of the guiding unit,

the dispensing side guiding unit can pivot on a shaft which is located beside the guiding unit,

the fixing unit is an automatic fixing unit which is automatically fixed based on the returning movement of the dispensing side guiding unit,

a detecting unit for detecting, as there isn't the dispensing side guiding unit on the extending line of the hopper side guiding unit,

a controlling unit for turning off the electrical motor, when the detecting unit detects there is not dispensing side guiding unit.

[Embodiment 1]

[0024]

Fig. 1 is a perspective view of the hopper with the embodiment.

Fig. 2 is a front view of the hopper of the embodiment deleting the bowl.

Fig. 3 is a rear view of the hopper deleted of the bowl of the embodiment.

Fig. 4 is an enlarged left hand side view of the separating section of the embodiment.

Fig. 5 is a part cross section view of the holding device of the embodiment.

Fig. 6 is a rear view side of the hopper when the dispensing guiding unit is pivoted in the embodiment.

[0025]

Hopper 10 includes base 11, hopper base 12 which is fixed at base 11 at approximately 60 degrees, rotating disk 13 for the let off of the disc D at the obverse side of hopper base 12 and bowl 14 which stores discs D as shown in figure 1.

Bowl 14 is a box to store more discs at a predetermined space.

For example, hopper 10 is known by the U.S. Patent 4589433.

[0026]

Guiding unit 15 is fixed at hopper base 11.

Discs D are let off by rotating disk 13 one by one and are aligned in guiding unit 15 and are dispensed by count sensor 16 one by one at the dispensing section of the end.

Guiding unit 15 includes hopper side guiding unit 17 which is fixed at hopper base 12 and dispensing side guiding unit 18.

In this embodiment, the guiding unit is made up of two equal parts however it can be made up of more equal parts.

[0027]

Next, hopper side guiding unit 17 is explained.

Hopper side guiding unit 17 includes hopper side base plate 19 which is rectangle and is fixed at base 12, a pair of spacers 21, 22 which are slightly thicker than the thickness of the disc D and are rectangular and a pair of upper side holding plate 23, 24 which have contact with spacers 21, 22.

[0028]

The distance of a pair of spacers 21, 22 is slightly larger than the diameter of disc D.

The distance between holding plate 23, 24 is smaller than the distance between spacers 21, 22.

The holding plate 23 and the spacer 21 are fixed at hopper side base plate 19 by screws 25, 26.

[0029]

Spacer 21 and holding plate 23 are pushed to base 19 by springs 27, 28 which are located between holding plate 23 and the heads of screws, which are combined integrally.

Also, holding plate 24 and spacer 22 are fixed at base 19 by screws 31, 32.

Spacer 22 and holding plate 24 are pushed to base 19 by springs 33, 34 which are located between holding plate 24 and the heads of screws, which are combined integrally.

[0030]

Groove 35 is U shaped at the cross section and extends longitudinally and is located at the middle of hopper side base plate 19.

Hopper side guiding unit 17 slants approximately at a 60 degree angle at the fixed section of hopper base 12.

The upper end is hopper side combining section 36 and is perpendicular.

The lower section of hopper side base plate 19 is fixed at the upper section of supporting body 20 by bolts (not shown).

The lower section of supporting body 20 is fixed at base plate 11.

[0031]

Supporting body 20 structures hopper side guiding unit 17 however it cannot be used.

Hopper side combining section 36 has hopper side concave section 37.

The upper section of base plate 19 is crank like in shape.

The concave section 37 is structured between base plate 19 and hopper side spacers 21, 22.

The upper section of base plate 19 slants towards the outside and structures hopper side guide 38.

Hopper side guiding passageway 39 is enclosed by base plate 19, spacers 21, 22 and holding plates 23, 24 and is rectangle at the cross section and extends perpendicular.

[0032]

Next, dispensing side guiding unit 18 is explained.

Dispensing side guiding unit 18 includes dispensing side base plate 41 which is rectangle, a pair of spacers 42, 43 which are slightly thicker than the thickness of the disc D and rectangle shaped like an elongated plate and a pair of dispensing side holding plates 44, 45 which have contact with spacers 42, 43.

The distance between spacers 42 and 43 is the same as the distance between spacers 21 and 22.

The distance between holding plates 44 and 45 is the same as the distance between holding plates 23 and 24.

[0033]

Dispensing side spacers 42, 43 are sandwiched between holding plates 44, 45 and base plate 41 because of screws 46 screw into base plate 41, and they are combined.

The dispensing side guiding passageway 47 is enclosed by base plate 41, spacers 42, 43 and holding plates 44, 45.

Stay 48 is located under base plate 41, is located beside guiding passageway 39 and extends downwards rather than to spacers 42, 43.

[0034]

Dispensing side holding plates 44, 45 extend downwards as the same as base plate 41.

Dispensing side concave 49 is structured between base plate 41 and holding plates 44, 45.

The lower sections of holding plates 44, 45 and base plate 41 structure dispensing side combining section 51.

Hopper side spacers 21, 22 can be inserted into dispensing side concave 49.

The lower sections of holding plates 44, 45 slant towards the outside which makes up dispensing side guide 50.

[0035]

Separating section 52 is structured by dispensing side combining section 51 and hopper side combining section 36.

Bearing 54 is cylinder and is fixed at attaching section 53 which extends toward the side from supporting body 20.

The attaching section 53 is located beside guiding passageway 39 and is lower than separating section 52.

The lower section of attaching section 53 is at an approximate right angle which makes up the first stopper 57.

Attaching section 53 can be made up of the extending section of base plate 19.

Shaft 56 is fixed at stay 48 of base plate 41 and can pivot on bearing 54 which has a predetermined length.

The length of shaft 54 is longer than the diameter of shaft 56.

[0036]

Therefore the axis line of shaft 56 crosses to a hypothetical plane which includes the disc face in guiding passageway 58 (hopper side guiding passageway 39 and dispensing side guiding passageway 47) at a right angle.

In other words, dispensing side guiding passageway 47 can pivot in the hypothetical plane which includes the upper section of hopper side guiding passageway 39.

When dispensing side guiding unit 18 pivots at the predetermined angle and is approximately level, first stopper 57 has contact with stay 48 and is stopped by the first stopper 57.

[0037]

Therefore guiding unit 15 can be separable to cross at a right angle at separating section 52 which is located in the middle longitudinal.

Lower section 59 of dispensing side base plate 41 is inserted into hopper side concave

section 37.

Hopper side spacers 21, 22 are inserted into dispensing side concave 49.

Butterfly bolts 69, 70 penetrate dispensing side holding plates 44, 45, hopper side spacers 21, 22 and lower section 59 of dispensing side base plate 41, and screw into hopper side base plate 19.

Fixing unit 80 is butterfly bolts 69, 70.

Therefore dispensing side guiding unit 18 is fixed at the upper section of hopper side guiding unit 17.

[0038]

As a result, hopper side guiding passageway 39 and dispensing side guiding passageway 47 are combined to the longitudinal direction and make up guiding passageway 58 which extends perpendicular.

In other words, dispensing side base plate 41 is located on the extending line of hopper side base plate 19, dispensing side spacer 42 is located on the extending line of hopper side spacer 21, dispensing side spacer 43 is located on the extending line of hopper side spacer 22, dispensing side holding plate 44 is located on the extending line of hopper side holding plate 23 and dispensing side holding plate 45 is located on the extending line of hopper side holding plate 24.

[0039]

Next, buffering unit 60 is explained.

Buffering unit 60 has a function which reduces the pivoting speed of dispensing side guiding unit 18.

In other words, when the dispensing side guiding unit 18 is stopped, the shock is buffered.

As shown in figure 3, buffering unit 60 includes spring 61 and guide 62.

Spring 61 is a leaf spring in this embodiment however it can be changed to either a bar spring, a coil spring or etc.

Fixed bearing 63 at the upper section of spring 61 can pivot on pin 64 which is fixed at the rear of dispensing side base plate 41.

When bearing 63 can be fixed at pin 64, the buffering effect increases.

[0040]

Next, guide 62 is explained.

Guide 62 has a function which does the elastic deformation because of the deformation of spring 61 is limited.

Guide 62 includes rectangular guiding hole 66 which is located at guiding board 65 which bends level at supporting body 20 and guiding bar 67 which is level and is located under

guiding board 65 and is fixed at supporting body 20.

The lower section of spring 61 penetrates guiding hole 66 and is located at the side of shaft 56 than guiding bar 67.

The lower end of spring 61 is U shaped and is stopper 68.

[0041]

When dispensing side guiding unit 18 pivots on shaft 56, the lower section of spring 61 is kept perpendicular by guiding hole 66 and guiding bar 67.

Therefore dispensing side guiding unit 18 receives the force which pivots in the clockwise direction by spring 61 as shown in figure 3.

[0038]

Accordingly, when the slant of dispensing side guiding unit 18 increases, the force increases too.

In other words, the pivoting speed reduces, as a result the shock of dispensing side guiding unit 18 is buffered.

Stopper 68 is stopped by guiding bar 67, therefore the sliding of spring 61 to guide 62 is stopped.

Finally, the shock of dispensing side guiding unit 18 is buffered by the movement of spring 61 and is stopped by the first stopper 57.

Guide 62 can be changed to a guiding hole which extends perpendicular. In the embodiment, the functions of guiding hole 66 and guiding bar 67 are unified.

[0042]

When dispensing side guiding unit 18 pivots on shaft 56 and is level, counting sensor 16 is located at the inside rather than the side end of bowl 14 as shown in figure 6.

Therefore, when the device is moved or mishandled, the sensor is protected by bowl 14.

[0043]

Holding unit 71 is fixed at the lower section of dispensing side guiding unit 18.

Holding unit 71 includes guiding section 73 and stopper 74.

Guiding section 73 is located beside dispensing side guiding passageway 47 and the middle of stay 72 and is an half egg shape.

Stopper 74 is located at guiding section 73 and is for example; ball 75.

[0044]

Stay 72 is fixed at holding plates 44, 45 by screws 76 which screw into base plate 41.

The extending line of slanting surface 77 inside guiding section 73 crosses to dispensing side guiding passageway 47 at an acute angle.

[0045]

When holding unit 71 is located lower in the embodiment, the extending line of slanting surface 77 crosses to hopper side guiding passageway 39 at an acute angle.

In other words, the distance between slanting surface 77 and dispensing side guiding passageway 47 is narrow rather than at the lower section.

Accordingly, when ball 75 goes down by gravity, it moves toward dispensing side guiding passageway 47 by slanting surface 77.

[0046]

Therefore disc D is pushed to dispensing side base plate 41 by ball 75, and it is kept at the position.

Ball 75 is made of iron and has surface plating.

Stopper 74 can be changed to a unit which has the same function that can keep the disc.

Also stopper 74 can be changed to a wedge shape.

[0047]

When holding unit 71 is structured by stopper 74 which falls down by gravity and slanting surface 77, it is less expensive because it doesn't use a driving unit.

Releasing unit 78 is located at the lower section of slanting surface 77.

In this embodiment, releasing unit 78 is opening 79.

Opening 79 can be made up from a circle (shown in embodiment), rectangle, oval, slot or etc.

[0048]

In other words, a bar type tool is inserted in opening 79, and ball 75 is moved by the tool.

Releasing unit 78 has a function that releases the keeping function to disc by holding unit 71.

[0049]

When ball 75 keeps the disc, it is located above rather than the lower edge of opening 79.

Therefore, when ball 75 is moved towards the side of counting sensor 16 by a screw driver which is inserted at opening 79, disc D is released.

Holding unit 71 can be changed to another unit which has the same the function which can hold and releases disc D in dispensing side passageway 47.

[0050]

Counting sensor 16 of dispensing side guiding unit 18 includes projecting unit 81 and sensor 82.

Projecting unit 81 is known as U.S. Patent 4592377.

When projecting unit 81 pivots, it faces sensor 82.

Therefore sensor 82 outputs a counting signal.

[0051]

Next, the operation of the embodiment is explained.

Rotating disc 13 rotates, lets off the disc D to guiding passageway 39 of hopper side guiding unit 17 one by one.

In other words, discs D are aligned in hopper side guiding passageway 39 and have contact with each peripheral.

[0052]

Discs D are pushed by a new disc D which is let off from rotating disk 13, and they reach dispensing side guiding passageway 47.

The top disc D in dispensing side guiding passageway 47 is dispensed by projecting unit 81. The movement of projecting unit 81 is detected by sensor 82, afterwards the sensor 82 outputs a signal for counting the discs D.

[0053]

Next, the separating work which is between dispensing side guiding unit 18 and hopper side guiding unit 17 is explained.

Firstly, butterfly bolts 69, 70 are released and are taken away from dispensing side guiding unit 18.

Next, dispensing side guiding unit 18 is laid perpendicular as shown in figure 3 to the level as shown in figure 5 towards the counter clockwise direction.

[0054]

In this process, the lower section of spring 61 is guided by guiding hole 66 and guiding bar 67.

Therefore the lower section is kept at the perpendicular situation, and spring 61 is transformed to an arc shape.

The pivoting speed of dispensing side guiding unit 18 reduces according to the deformation. In addition to, the deformation of spring 61 increases, because stopper 68 is stopped by the guiding bar 67.

As a result, the pivoting speed reduces.

Finally, stay 48 is stopped by first stopper 57, and dispensing side guiding unit 18 is stopped.

[0055]

When dispensing side guiding unit 18 is stopped by first stopper 57, the shock reduces drastically because of the pivoting speed is reduced.

Accordingly, dispensing side guiding unit 18 is separated from hopper side guiding unit 17.

At the same time, discs D in dispensing side guiding passageway 47 falls down by gravity.

Ball 75 of holding unit 71 falls down by gravity and is moved towards dispensing side base

plate 41 by slanting surface 77.

[0056]

Therefore disc D is pushed to dispensing side base plate 41 by ball 75 and is kept at the position.

As a result, disc D cannot fall down from dispensing side passageway 47.

The discs D are stacked and are stopped by the last disc D which is kept in dispensing passageway 47.

[0057]

The lower disc D is located under ball 75, and falls down.

The disc D is only one or two discs, because ball 75 is located at the lower section of dispensing side guiding passageway 47.

When the disc D falls down, the recycling work is easy, because there is only one or two discs.

In this situation, the hopper can be packaged and transported.

Accordingly, the packaging height is lower, and the capacity is reduced, as a result the transporting efficiency is improved.

[0058]

When discs D are taken away from dispensing side guiding unit 18, a screw driver is inserted through opening 79, and ball 75 is pushed up.

Therefore ball 75 isn't pushed towards disc D or dispensing side base plate 41.

As a result, disc D can move in dispensing side guiding passageway 47.

In this situation, jammed discs D are moved and are taken away from dispensing side guiding passageway 47 and are dissolved.

[0059]

The jammed discs D in hopper side guiding passageway 39 are dissolved as the same as above mentioned.

The jammed discs D are dissolved, afterwards dispensing side guiding unit 18 is connected with hopper side guiding unit 17 in the opposite steps of the above mentioned procedure.

In other words, dispensing side guiding unit 18 pivots on shaft 56 and goes perpendicular. [0060]

In this process, dispensing side base plate 41 and dispensing side hlding plates 44, 45 pivot in the plane which is parallel to the hopper side concave 37.

Firstly, lower section 59 of dispensing side base 19 goes into hopper side concave 37.

Also, the upper section of hopper side spacer 22 goes into dispensing side concave 49.

[0061]

Next, the upper section of hopper side spacer 21 goes to dispensing side concave 49.

In this process, hopper side combining section 36 and dispensing side combining section 51 are combined in the lateral direction, because shaft 56 is located beside guiding passageway 58.

Accordingly, lower section 59 is guided by hopper side concave 37 and hopper side spacers 21, 22 are guided by dispensing side concave 49.

[0062]

When the pivoting plains are out of alignment, lower section 59 is guided by the slanting section of hopper side guide 38 and hopper side spacers 21, 22 are guided by dispensing side guide 50 into dispensing side concave 49.

When hopper side guiding passageway 39 and dispensing side guiding passageway 47 are aligned, butterfly bolts 69, 70 are screwed into hopper side base 19 and are combined.

Therefore hopper side guiding unit 17 and dispensing side guiding unit 18 are combined.

[0063]

Also, when dispensing side guiding unit 18 pivots on shaft 56 to the level for example, the upper end of ball 75 is lower.

When the entrance of gaming machine for the hopper is smaller, the hopper can be taken in or out easily.

[0064]

When the hopper is either in or out the gaming machine the dispensing side guiding unit 18 is removed as mentioned, and is fixed at hopper side guiding unit 17 by butterfly bolts 69, 70.

The assembly and disassembly of this gaming machine is much easier.

[Embodiment 2]

[0065]

Fig. 7 is a perspective view of the hopper with the guiding unit of the embodiment.

Fig. 8 is a front view of the hopper which deleted the bowl and includes the guiding unit of the embodiment.

Fig. 9 is a rear view of the hopper with the embodiment.

Fig. 10 is an enlarged left hand side view of the separating section of the embodiment.

Fig. 11 is a rear view side of the hopper when the dispensing guiding unit is pivoted in the embodiment.

Fig. 12 is a cross section view along A-A line in figure 4 of the fixing unit in the embodiment.

Fig. 13 is a circuit diagram of the embodiment.

[0066]

The different structures to the embodiment 1 is explained and the same structures to embodiment 1 is attached as the same number.

Supporting body 20 of this embodiment is channel like in shape at a cross section, and the lower section is fixed at base 11, however it isn't necessary to fix it.

Hopper side connecting section 36 has tier 201.

The upper section of base 19 is bent horizontally and is guiding section 65, because of strengthening and made up of after mentioned guiding hole 66.

Dispensing side spacers 21, 22 extend downwards as the same as base plate 19.

The lower sections of spacers 21, 22, the lower section of base plate 19 and the lower section of holding plates 23, 24 and base plate 19 structure dispensing side connecting section 49.

The lower sections of holding plates 44, 45 slant towards the outside which makes up dispensing side guide 202.

[0067]

Shaft 204 is fixed between the side walls supporting body 20 which is channel like in shape and is horizontally.

Also shaft 204 is located beside hopper side guiding passageway 39 and is under than combining section 51.

Therefore the axis line of shaft 204 crosses to a hypothetical flat surface which includes the disc face in guiding passageway 58 (hopper side guiding passageway 39 and dispensing side guiding passageway 47) at a right angle.

In other words, dispensing side guiding passageway 47 can pivot in the hypothetical plane which includes the upper section of hopper side guiding passageway 39.

[0068]

Bearing 208 is cylinder and is fixed between the side walls at the lower section of lever 206 which is channel like in shape.

Shaft 204 is rotatable in bearing 208.

The lower section of lever 206 is located at the groove of supporting body 20 as shown in figure 7.

Therefore lever 206 can pivot in the plane which is parallel to the plane which include guiding passageways 39 and 47.

Therefore guiding unit 15 can be separable to cross at a right angle at connecting section 52 which is located in the middle longitudinal.

[0069]

Attaching section 210 is bent at a right angle at the light end of dispensing side base plate 41 and is fixed at bottom 207 of the upper section of lever 206.

Operating section 212 is made up at an end of the side wall of lever 206 which is bent to a right angle to guiding passageway 58.

These structures are stronger and smaller because of the supporting body 20 and lever 206 is channel like in shape.

[0070]

Next fixing unit 80 for dispensing side guiding unit 18 is explained.

Fixing unit 80 is for example; one touch fixing unit 214 and it is desirable for easier operation.

Next one touch fixing unit 214 is explained referring to figure 12.

One touch fixing unit 214 includes cylinder 218, slider 222, spring 221 and stopper 226. Cylinder 218 is pressed into hole 216 which is located at the upper section of supporting body 20.

Slider 222 can slide in hole 220 of cylinder 218.

Slider 222 which protrudes outside is pushed by spring 221.

Stopper 226 stops slider 222.

[0071]

Pin section 228 at the end of slider 222 has the chamfered edge at the end and is thickly inserted into through hole 230 which is located at lever 206.

When pin section 228 penetrates into through hole 230, dispensing side guiding unit 18 is located on extending line of hopper side guiding unit 17.

In other words, dispensing side guiding passageway 47 is located on the extending line of hopper side guiding passageway 39, and they structure guiding passageway 58.

[0072]

Stopper 226 can be held by an operator, then is moved towards the right in figure 12.

Therefore slider 222 moves out from through hole 230.

Lever 206; in other words dispensing side guiding unit 18 can pivot at shaft 204.

As a result, dispensing side guiding unit 18 can be laid down.

When dispensing side guiding unit 18 is returned, stopper 226; in other words; slider 222 is moved towards the right and the end of pin section 228 is pulled into cylinder 218.

Afterwards dispensing side guiding unit 18 is pivoted, then bottom wall 207 of lever 206 has contact with stopper 232 which is a L cross section and extends from supporting body 20.

[0073]

In this situation, pin section 228 faces through hole 230.

Therefore stopper 226 is off the hook.

Slider 222 is moved to the left by spring 221.

Then pin section 228 proceeds into through hole 230, and dispensing side guiding unit 18 is fixed.

[0074]

In this situation, dispensing side base plate 41 is located on the extending line of hopper side base plate 19, dispensing side spacer 42 is located on the extending line of hopper side spacer 21, dispensing side spacer 43 is located on the extending line of hopper side spacer 22, dispensing side holding plate 44 is located on the extending line of hopper side holding plate 23 and dispensing side holding plate 45 is located on the extending line of hopper side holding plate 24.

Accordingly, hopper side guiding passageway 39 is connected with dispensing side guiding passageway 47 and they make up guiding passageway 58 which extends perpendicular.

The upper section of spring 61 is fixed at stay 234 which penetrates towards the rear from base plate 41 at a right angle.

The material with elasticity of spring 61 can be chosen from an iron, a resin, FRP or etc, however steel is best, because it is cheaper and long life.

[0075]

Next, controlling circuit 238 of electrical driving unit 236 of hopper 10 is explained.

Electrical driving unit 236 is electrical motor 240 which drives the rotating disc 13 through reducer 242.

Electrical motor 240 is connected in series micro switch 244, contactor 246 which is opened or closed by the controlling unit of gaming machine and power source 248.

[0076]

When micro switch 244 is opened, motor 240 does not rotate.

The dispensing side guiding unit detecting device is micro switch 244 however it can be changed to another switch means which has the same function.

Micro switch 244 is fixed at the side wall of supporting body 20.

Driven piece 250 of micro switch 244 is pushed by operating section 212 and is located at the "ON" position.

[0077]

When dispensing side guiding unit 18 is fixed by fixing unit 48, driven piece 250 is pushed by operating section 212.

Therefore micro switch 244 becomes "ON".

When driven piece is not pushed, micro switch 244 is "OFF".

In other words, when dispensing side guiding unit 18 fall, micro switch 244 is "OFF" and controlling circuit 238 continues in the open situation, however contactor 246 is closed.

[0078]

Next, the operation of the embodiment is explained.

When dispensing side guiding unit 18 is located at the extending line of hopper side guiding unit 17 and is fixed by fixing unit 80, driven piece 250 of micro switch 244 is pushed by operating section 212.

Therefore micro switch 244 is "ON".

When contactor 246 became "ON" by the controlling unit, controlling circuit 238 becomes "ON", therefore motor 240 rotates.

Rotating disc 13 rotates by motor 240, and lets off the disc D to guiding passageway 39 of hopper side guiding unit 17 one by one.

In other words, discs D align in hopper side guiding passageway 39 and have contact with each peripheral.

[0079]

Discs D are pushed by new disc D which is let off from rotating disk 13, and they reach in dispensing side guiding passageway 47.

The top disc D in dispensing side guiding passageway 47 is dispensed by projecting unit 81. The movement of projecting unit 81 is detected by sensor 82, afterwards the sensor 82 outputs a signal for counting the discs D.

[0080]

Next, the separating work which is between dispensing side guiding unit 18 and hopper side guiding unit 17 is explained.

Firstly, stopper 226 is held by an operator, and slider 222 is taken away from through hole 230.

Next, dispensing side guiding unit 18 lay down from the perpendicular as shown in figure 9 to the level as shown in figure 11 in the counter clockwise direction.

[0081]

In this process, the lower section of spring 61 is guided by guiding hole 66 and guiding bar 67.

Therefore the lower section is kept at the perpendicular situation, and spring 61 is transformed to an arc shape.

The pivoting speed of dispensing side guiding unit 18 reduces according to the deformation. In addition to, the deformation of spring 61 increases, because stopper 68 is stopped by the guiding bar 67.

Also projection 254 has contact with the inside wall of supporting body 20 and stops.
As a result, the pivoting speed drastically reduces.

[0082]

Accordingly, dispensing side guiding unit 18 is separated from hopper side guiding unit 17.
Also driven piece 250 is not pushed by operating section 212.

Therefore micro switch 244 becomes "OFF", and controlling circuit 238 is opened.

In this situation, when contactor 246 becomes "ON", motor 240 does not rotate.

As a result, discs D are not dispensed.

When dispensing side guiding unit 18 is separated, discs D in dispensing side guiding passageway 47 falls down by gravity, however it doesn't fall down the same as embodiment 1.

[0083]

When dispensing side guiding unit 18 is combined with hopper side guiding unit 17 in the opposite steps of the above mentioned procedure.

In other words, dispensing side guiding unit 18 pivots on shaft 204 and goes perpendicular. Therefore dispensing side base 19 is located on the extending line of hopper side base 19, dispensing side spacers 42, 43 are located on each of the extending lines of hopper side spacers 21, 22 and dispensing side holding plates 44, 45 are located on each of the extending lines of hopper side holding plates 23, 24.

[0084]

When the pivoting plains are out of alignment, dispensing guides 202 are guided by hopper side spacers 21, 22 and the positions becomes above-mentioned situation.

Next stopper 226 is held by an operator, and slider 222 is moved, and pin section 228 is pulled into cylinder 218.

Afterwards, lever 206 is pushed to stopper 232.

Also slider 222 becomes free, and pin section 228 goes into through hole 230 by spring 221.

Therefore dispensing side guiding unit 18 is fixed at hopper side guiding unit 17.

As a result, guiding unit 15 is structured.

[0085]

When the hopper is either in or out of the gaming machine the dispensing side guiding unit 18 is removed as mentioned, and is fixed at hopper side guiding unit 17 by one touch fixing unit 214 which is a "one-touch".

The assembly and disassembly of this gaming machine is much easier.

[Embodiment 3]

[0086]

Figure 14 is a perspective view of the hopper with the guiding unit of the embodiment 3.

Figure 15 is a rear view of the hopper with the guiding unit of the embodiment 3 detached the bowl.

Figure 16 is a front view of the hopper with the guiding unit which is laid down which is embodiment 3.

Figure 17 is an enlarged front view of the automatic fixing unit of the embodiment 3.

Figure 18 is a rear perspective view of the hopper with the guiding unit which is laid down which is embodiment 3 (detached the bowl).

[0087]

The different structures of embodiments 1 and 2 are explained however the same structures of embodiments 1 and 2 are attached as the same number.

This embodiment doesn't include the buffering unit 60.

Support 300 is perpendicularly fixed at base 11 .

Carrying handle 302 is gate like in shape and is fixed at support 300 for hopper base 12.

The other end of the carrying handle 302 is fixed at supporting body 20 and it reinforces the supporting body 20.

Handling section 304 of carrying handle 302 is parallel to base 11 and is easy to grasp.

In other words, when hopper 10 is in a gaming machine, the handling section 304 is level.

[0088]

Fixing unit 80 of this embodiment is an automated fixing unit 306 where an operator doesn't have to operate.

Next the automated fixing unit 306 is explained.

Holding groove 310 slants downwards and is located at plate 308 which protrudes towards the side from the upper rear wall of supporting body 20.

[0089]

Pin 316 protrudes towards the rear from convex section 314 of rear wall 312 of lever 206 which can pivot on shaft 204 together with dispensing side guiding unit 18.

Pin 316 is cylinder like in shape and can proceed into the holding groove 310.

Hooking unit 318 is located adjacent to plate 308 and is located at the side of the rear wall of supporting body 20, and is pivotable on shaft 320 which penetrates from the rear wall of supporting body 20.

Hooking unit 318 has a concave section at the lower edge.

Hook 322 is the concave section.

[0090]

When a part (the right side shown in figure 15) of pin 316 has contact furthest area of wall 323 of holding groove 310, it stops opposite of pin 316 (the left side shown in figure

15).

Therefore dispensing side guiding unit 18 is stopped to pivot in the counterclockwise direction shown in figure 15.

The lower surface rather than the hook 322 of hooking unit 318 is slanting surface 324 which slants downwards hook 322.

The rear upper section of hooking unit 318 is bent approximately level and is rectangular and is releasing section 326 for hooking unit 318.

[0091]

The middle section of hooking unit 318 is wound on shaft 320, and an end is hooked at the lower surface of releasing section 326, also the other end is hooked at stopper 328 which protrudes from supporting body 20.

Therefore hooking unit 318 pivots in the counterclockwise direction shown in figure 15.

Also arc elongate hole 332 is arc like in shape in the center where is shaft 320 is as shown in figure 17.

Pin 334 penetrates from the side surface of hooking unit 318 and can be inserted into the arc elongate hole 332.

Therefore hooking unit 318 is pivoted by spring 330, also the pin 334 is stopped by lower edge 336 of arc elongate hole 332.

[0092]

When releasing section 326 is pushed down, pin 334 is stopped by upper edge 338 of arc elongate hole 332.

In the situation, hooking unit 318 doesn't hook pin 316.

Also, when dispensing side guiding unit 18 laid down as shown in figure 16, bottom wall 207 of lever 206 has contact with the upper surface of the middle section 304 of carrying handle 302 and is supported at that situation.

In this situation, screws can be screwed into the screw holes (not shown) of middle section 304 through elongate hole 340 of lever 206.

Therefore the lever 206 is fixed at middle section 304.

As a result, dispensing side guiding unit 18 doesn't vibrate on the way to transport.

[0093]

Next the operation of this embodiment is explained.

When dispensing side guiding unit 18 is moved from the separating situation onto the extending line of hopper side guiding unit 17, pin 316 has contact with slanting surface 324.

Therefore pin 316 pushes up hooking unit 318 and pivots hooking unit 318 in the

counterclockwise direction as shown in figure 17.

When pin 316 has contact with the back wall 323 of arc elongate hole 310, slanting surface 324 is unhooked from pin 316.

[0094]

Therefore hooking unit 318 is pivoted in the counterclockwise direction by spring 330 as shown in figure 15, afterwards hook 322 hooks pin 316.

As a result, hook 322 stops the returning movement of dispensing side guiding unit 18.

In other words, dispensing side guiding unit 18 is fixed.

When the dispensing side guiding unit 18 is separated, releasing section 326 is pushed down, also hooking unit 318 is pivoted in the clockwise direction as shown in figure 15.

In this situation, the upper edge 338 of arc elongate hole stops pin 334, therefore the over pivoting of hooking unit 318 is prevented.

[0095]

When pin 334 is stopped by upper edge wall 338, hook 322 unhooks pin 316.

Therefore dispensing side guiding unit 18 can pivot in the counterclockwise direction shown in figure 15 and becomes in the laid situation.

In this embodiment 3, dispensing side guiding unit 18 is automatically fixed by automatically fixing unit 306 based on the returning movement.

Also, when dispensing side guiding unit 18 is laid, releasing section 326 is pushed down.

The operation is easier.

[Industrial Applicability]

[0096]

This invention can be used to a coin dispensing machine at a gaming machine for example a slot machine.

[BRIEF DESCRIPTION OF THE DRAWINGS]

[0097]

[Fig. 1] Fig. 1 is a perspective view of the hopper with the embodiment.

[Fig. 2] Fig. 2 is a front view of the hopper of the embodiment deleting the bowl.

[Fig. 3] Fig. 3 is a rear view of the hopper deleted of the bowl of the embodiment.

[Fig. 4] Fig. 4 is an enlarged left hand side view of the separating section of the embodiment.

[Fig. 5] Fig. 5 is a part cross section view of the holding device of the embodiment.

[Fig. 6] Fig. 6 is a rear view side of the hopper when the dispensing guiding unit is pivoted in the embodiment.

[Fig. 7] Fig. 7 is a perspective view of the hopper with the guiding unit of the embodiment.

[Fig. 8] Fig. 8 is a front view of the hopper which deleted the bowl and includes the guiding unit of the embodiment.

[Fig. 9] Fig. 9 is a rear view of the hopper with the embodiment.

[Fig. 10] Fig. 10 is an enlarged left hand side view of the separating section of the embodiment.

[Fig. 11] Fig. 11 is a rear view side of the hopper when the dispensing guiding unit is pivoted in the embodiment.

[Fig. 12] Fig. 12 is a cross-section view along A-A line in figure 4 of the fixing unit in the embodiment.

[Fig. 13] Fig. 13 is a circuit diagram of the embodiment.

[Fig. 14] Figure 14 is a perspective view of the hopper with the guiding unit of the embodiment 3.

[Fig. 15] Figure 15 is a rear view of the hopper with the guiding unit of the embodiment 3 detached the bowl.

[Fig. 16] Figure 16 is a front view of the hopper with the guiding unit which is laid down which is embodiment 3.

[Fig. 17] Figure 17 is an enlarged front view of the automatic fixing unit of the embodiment 3.

[Fig. 18] Figure 18 is a rear perspective view of the hopper with the guiding unit which is laid down which is embodiment 3 (detached the bowl).

[Description of the code]

D disc

10 hopper

15 guiding unit

17 hopper side guiding unit

18 dispensing side guiding unit

56 shaft

60 buffering unit

80 fixing unit

238 controlling circuit

244 detecting unit for dispensing side guiding unit

306 automated fixing unit

[Document name] Drawing

[Fig. 1]

[Fig. 2]

[Fig. 3]

[Fig. 4]

[Fig. 5]

[Fig. 6]

[Fig. 7]

[Fig. 8]

[Fig. 9]

[Fig. 10]

[Fig. 11]

[Fig. 12]

[Fig. 13]

[Fig. 14]

[Fig. 15]

[Fig. 16]

[Fig. 17]

[Fig. 18]